REACTOR WITH REMOTE PLASMA SYSTEM AND METHOD OF PROCESSING A SEMICONDUCTOR SUBSTRATE

ABSTRACT

A reactor for processing a semiconductor substrate includes a reactor housing which defines a processing chamber, and at least one gas injecting assembly. The processing chamber is adapted to support a semiconductor substrate therein. The gas injection assembly injects at least one gas into the processing chamber and onto the substrate and is adapted to ionize the gas injection into the processing chamber to increase the reactivity of the gas with the substrate to thereby enhance the processing of the semiconductor substrate. In preferred form, the gas is ionized into a gas plasma. For example, the gas injection assembly may include a gas plasma generator which ionizes the gas with an electromagnetic field. Preferably, the gas plasma generator ionizes the gas exteriorly of the processing chamber to isolate the substrate from the plasma generator. The gas injection assembly further includes one or more injection tubes, preferably quartz tubes, with each tube including a plurality of orifices through which the ionized gas is delivered into the processing chamber.